

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the information transmission system which transmits information to the mobile station installed in the mobile through a wireless circuit.

[0002]

[Description of the Prior Art] In recent years, in the information transmission system which carries out the radio transmission of the information to a mobile, to be able to be flexibly adapted for various services like transmission of the image information to a train or transmission of the traffic information over a bus for example, is demanded. Moreover, it is also possible to use a satellite circuit according to each informational class and informational use gestalt as an approach of transmitting the information that amount of information is large to a mobile certainly and efficiently compared with speech information.

[0003] Drawing 20 is drawing showing the conventional example of the information-transmission structure of a system. drawing -- setting -- (a) the sending station 201 installed on the ground in the shown information transmission system -- a wireless circuit -- minding -- mobile station 2021 It connects. Mobile station 2021 The receive section antenna 2031 by which cascade connection was carried out, and the memory section 2041 And it consists of displays 2051. By having the communication satellite 207 which replaced with the sending station 201 mentioned above in the information transmission system shown in (b), went up to an earth station 206 and its earth station, and was connected through the satellite circuit, it gets off the communication satellite, a satellite circuit is minded, and it is a mobile station 2022. It connects. mobile station 2022 The receive section antenna 2032 by which cascade connection was carried out, and the memory section 2042 And display 2052 from -- it is constituted.

[0004] In the mobile station 2021 (2022) in the information transfer system of such a configuration, a sending station 201 and a communication satellite 207 receive directly the signal modulated and transmitted for transmission information, and get over, and the transmission information acquired by the recovery is changed into the information corresponding to display processing by the memory section 2041 (2042), and is memorized. A display 2051 (2052) reads and displays the information memorized by doing in this way.

[0005]

[Problem(s) to be Solved by the Invention] by the way, in the system using the carrier signal of the frequency below a UHF band, like a radio broadcasting or television broadcasting among the information transmission systems shown in drawing 20 (a) Mobile station 2021 Even if the transmission line and a bridge exist on the propagation path of the wireless circuit formed between sending stations 201 Compared with the case

where the carrier signal of an SHF band is used, there is little magnitude of attenuation in the propagation path, and it is a mobile station 2021. Since the period of phasing produced with migration is long, it is a mobile station 2021. Information was able to be transmitted in many cases. However, in the information transmission system shown in drawing 20 (b), since the received electric-field level was much [sensibility / of a receiving station / receiving] less even if it gets down, and the signal of a satellite circuit does not reach or it reaches, information was able to be certainly transmitted to neither the mobile station which has run or stopped in a tunnel since transmission is performed using the carrier signal of a frequency higher than an SHF band, nor the mobile station installed in the car of a subway in many cases.

[0006] This invention aims at offering the information transmission system which can transmit the transmission information to the mobile station located in the point which cannot carry out direct reception of the received wave modulated for transmission information certainly and efficiently.

[0007]

[Means for Solving the Problem] Drawing 1 is the principle block diagram of invention according to claim 1. In the information transmission system with which this invention transmits information to a mobile station 11 through a wireless circuit The mobile station is equipped with the relay center 17 which has the transmitting means 15 which carries out the radio transmission of the information memorized by the transmission information storage means 13 in the shunt on a transmission information storage means 13 to receive and memorize information from a wireless circuit, and the orbit of the mobile, in which the mobile station 11 was installed. To a mobile station 11 It is characterized by having an output means 19 to output in the mobile in which the information by which the radio transmission was carried out was restored and the local station was installed by the transmitting means 14.

[0008] Drawing 2 is the principle block diagram of invention according to claim 2. In the information transmission system with which this invention transmits information to a mobile station 11 through a wireless circuit The mobile station is equipped with the relay center 17 which has the transmitting means 15 which carries out the radio transmission of the information memorized by the transmission information storage means 13 in the shunt on a transmission information storage means 13 to receive and memorize information from a wireless circuit, and the orbit of the mobile, in which the mobile station 11 was installed. To a mobile station 11 It is characterized by having the retransmission-of-message means 21 which carries out a radio transmission again in the mobile in which the information by which the radio transmission was carried out was incorporated and the local station was installed by the transmitting means 15.

[0009] Drawing 3 is the principle block diagram of invention according to claim 3. In the information transmission system with which this invention transmits information to a mobile station 11 through a wireless circuit The mobile station is equipped with the relay center 17 which has the transmitting means 15 which carries out the radio transmission of the information memorized by the transmission information storage means 13 in the

shunt on a transmission information storage means 13 to receive and memorize information from a wireless circuit, and the orbit of the mobile, in which the mobile station 11 was installed. To a mobile station 11 It is characterized by having an information-media supply means 31 to restore the information by which the radio transmission was carried out, and to memorize and supply a data-exchange medium with the transmitting means 15.

[0010] Drawing 4 is the principle block diagram of invention according to claim 4. This invention is 171-17 Ns of relay centers of plurality [top / which was instituted in claim 1 thru/or invention according to claim 3 in accordance with the orbit of the mobile in which the mobile station 11 was installed / multipoint link]. It arranges. 171-17 Ns of these relay centers It has a transfer means 41 to transmit the information memorized by the transmission channel assigned to the local station on the multipoint link at the transmission information storage means 13. **** -- It is characterized by having the sending station 43 which incorporates the information transmitted to two relay centers from the transfer means 41 of these relay centers through the transmission channel assigned according to the individual on the multipoint link, and carries out a radio transmission to a mobile station 11 between two relay centers which adjoined in accordance with the orbit.

[0011]

[Function] In an information transmission system according to claim 1, the transmitting means 15 carries out the radio transmission of the information received and memorized from the wireless circuit by the transmission information storage means 13 to a mobile station 11 in the shunt on the orbit of a mobile.

[0012] That is, the information physically transmitted to the wireless circuit while running the orbit top which cannot be accessed is certainly transmitted to a mobile station 11 at the wireless circuit which the mobile mentioned above in the installation neighborhood of a point of the transmitting means 15 of a relay center 17.

[0013] In an information transmission system according to claim 2, the information transmitted to the wireless circuit while running the orbit top to which the mobile in which the mobile station 11 was installed cannot access a wireless circuit physically like an information transmission system according to claim 1 is certainly transmitted to a mobile station 11 in the installation neighborhood of a point of the transmitting means 15 of a relay center 17. The retransmission-of-message means 21 formed in the mobile station 11 carries out the radio transmission of the information which did in this way and was transmitted from the relay center 17 again into the mobile of a local station.

[0014] Therefore, within a mobile, even if an output means to output the information mentioned above to the mobile is not installed or the output means is installed, also when information cannot be acquired from the output means by a certain cause, information is acquired by using the terminal corresponding to the radio transmission which the retransmission-of-message means 21 performs.

[0015] In an information transmission system according to claim 3, the information received from the wireless circuit while running the orbit top to which the mobile in which the mobile station 11 was installed cannot access a wireless circuit physically like an information transmission system according to claim 1 is certainly transmitted to a mobile station 11 in the installation neighborhood of a point of the transmitting means 15 of a relay center 17. The information-media supply means 31 formed in the mobile station 11 memorizes and supplies the information which did in this way and was transmitted from the relay center 17 to a data-exchange medium.

[0016] Therefore, it acquires through an accessible terminal unit and an accessible processor to the data-exchange medium mentioned above apart from the acquisition approach by the real time which minded an acoustic sense and vision in the mobile as an approach of acquiring the information mentioned above, and it becomes possible to process and use the acquired information for arbitration.

[0017] In an information transmission system according to claim 4, a sending station 43 incorporates the information transmitted from each relay center in these relay centers through the transmission channel assigned according to the individual on the multipoint link to which between two relay centers which adjoined the local station in accordance with the orbit of a mobile is connected, and carries out a radio transmission to a mobile station 11.

[0018] That is, since a mobile station 11 can receive information by the radio transmission from the sending station 43 mentioned above before reaching near the next relay center (installing point of the transmitting means 15) by transit of the mobile in which the local station was installed, its orbit which connects between two relay centers mentioned above is long, or also when the travel speed of a mobile is small, the information transmission to a mobile station 11 is performed efficiently.

[0019]

[Example] Hereafter, the example of this invention is explained to a detail based on a drawing. Drawing 5 is drawing showing the example corresponding to invention according to claim 1.

[0020] In drawing, an earth station 51 is connected to a communication satellite through an uphill satellite circuit, it gets down and the communication satellite is connected to a relay center 52 through a satellite circuit. A relay center 52 is connected to the mobile station 53 installed on the car of a subway through a wireless circuit which gets down and is different from a satellite circuit.

[0021] An earth station 51 consists of transmitting antennas 55 connected with the sending set 54 at the output. In a relay center 52, it gets down and a satellite circuit is connected to the receive section 60 prepared in the station building of a subway through the cable 59 instituted the receiving antenna 56 installed on the terrestrial building, a frequency converter (LNB) 57, the booster amplifier 58, and within the communication link. The output of a receive section 60 is connected to the data input of the edit

processing section 61, the output means the transmitting section 62, and it is an antenna 631. It connects. The local program sending-out section (LPM) 64 is connected to edit I/O of the edit processing section 61 through a console 65.

[0022] In a mobile station 53, it responds to transit of a mobile station 53 at the wireless circuit mentioned above, and is an antenna 631. Antenna 632 with which an effective area counters It is prepared and the output is connected to a display 69 through a receive section 66, a control section 67, and the memory section 68.

[0023] in addition, about correspondence relation with the block diagram shown in this example and drawing 1 A mobile station 53 is equivalent to a mobile station 11, and a receiving antenna 56, a frequency converter 57, the booster amplifier 58, a cable 59, a receive section 60, and the edit processing section 61 correspond to the transmission information storage means 13. The transmitting section 62 and antenna 631 Corresponding to the transmitting means 15, a relay center 52 is equivalent to a relay center 17, and an antenna 632, a receive section 66, a control section 67, the memory section 68, and a display 69 correspond to the output means 19.

[0024] Hereafter, actuation of this example is explained. The sending set 54 of an earth station 51 modulates a carrier signal according to transmission information, and transmits it from the transmitting antenna 55. Such a transmission wave reaches the receiving antenna 56 of a relay center 52 through an uphill satellite circuit, a communication satellite, and a going-down satellite circuit. The signal received with the receiving antenna 56 is changed into a predetermined intermediate frequency signal by the frequency converter 57, and is further amplified by level predetermined with the booster amplifier 58 with it. Restoring to the intermediate frequency signal amplified by a receive section 60 doing in this way, the edit processing section 61 memorizes the transmission information acquired by the recovery.

[0025] On the other hand, advertisement information and the information on operating communication information and others are beforehand memorized by the local program sending-out section 64. A console 65 sets up the information which should be transmitted to a mobile station 53 at the edit processing section 61 according to arrangement of the storage region shown in drawing 6 by editing the information memorized by the local program sending-out section 64 according to the actuation which an operator performs, and the information memorized by the edit processing section 61 based on predetermined priority. Thus, the information set up consists of the information which should be sent out to a mobile at the time of day set beforehand, advertisement information, information peculiar to a relay center, urgent communication information, and employment operating information. The transmitting section 62 is the antenna 632 arranged at the point of being almost fixed perpendicularly, from the rail (orbit) to which between stations is connected in each mobile station. In order to form a radio-transmission way stable about the mobile station under transit and stop in between Antenna 632 Antenna 631 of indirectivity [direction / of a horizontal plane / which countered the same height and has been arranged] The information which used and was set as the edit processing section 61 through the antenna is transmitted. About the priority used at the time of the edit mentioned above, by

enabling an adjustable setup according to the employment gestalt of a system, when there is no information which should be sent out on schedule, advertisement information can be sent out as a telop, or it can be adapted for various employment gestalten which send out urgent communication information and employment operating information more preferentially than other information.

[0026] on the other hand -- a mobile station 53 -- a receive section 66 -- antenna 631 the prepared station -- a local station -- stopping -- the antenna -- antenna 632 the timing which these two antennas countered similarly [in case it counters physically or a local station passes through the station] -- antenna 621 from -- the transmitted transmission wave is received and it gets over. A control section 67 incorporates the information acquired by such recovery processing, and writes information required for the real-time display of the information, or the synthetic display with the information and advertisement information in the memory section 68, corresponding to the display mode set up beforehand. A display 69 is beginning to read the information written in the memory section 68 one by one, and displays it.

[0027] According to this example, to thus, the mobile station installed in the mobile which runs in the tunnel which gets down and cannot carry out direct access to a satellite circuit Since the information which the relay center got down instead of the mobile station, and restored to the received wave of a satellite circuit, and was acquired by the recovery is edited and memorized and it transmits For example, characteristic information, urgent communication information, an employment operating report, and others can be certainly transmitted to a mobile station, and it can be flexibly adapted for a demand of the employment gestalt of a subway and various PAX at every information which should combine with the information on a program and should be sent out on schedule, advertisement information, and relay center (station).

[0028] In addition, although all relay centers are premised on receiving the information received through a satellite circuit from an earth station 51 in this example As this invention is not limited to the transmission system of such a satellite circuit, for example, is shown in drawing 7 The information code which combines with transmission information field and shows the class of transmission information to the transmitting frame transmitted from an earth station 51, By preparing the identification information field which shows the identification code which shows a transmission place, transmitting time, and the amount of information of transmit information, and an earth station's 51 arranging predetermined information in the identification information field, and transmitting to it The receive section 60 of a relay center 52 may use the approach of choosing the contents of transmission information field based on the contents of an information code or identification code. Furthermore, when such an approach is adopted, a single satellite circuit is shared and used by two or more enterprise objects, the city, the route, and others, or it becomes possible to perform processing according to individual with a relay center or a mobile station for every class of the information on a program, and information on operating communication information and others. Furthermore, the transmitting time included in the identification information field and the amount of information of transmit information are used as criteria of the edit processing which a

relay center performs as mentioned above, or the processing which the control section of a mobile station performs.

[0029] Moreover, the installing point of a display 69 is not limited to the wall surface in a mobile, for example, may be prepared in a head-lining side or a floor line, and as a drop employable as the display, as long as it suits the operating environment of a mobile like a liquid crystal display or CRT for example, what kind of thing may be used.

[0030] Drawing 8 is drawing showing the example configuration which has arranged the sending station between adjoining relay centers. The description of this example configuration meets the orbit of the rail which connects between these stations between the relay center 811 established in the adjoining station according to the individual, and 812, and is 821-82 Ns of two or more sending stations. It is in the point of having had and having connected the transmitting output of the transmitting section 62 of each relay center to these sending stations through the cable.

[0031] Drawing 9 is drawing showing the configuration of a sending station. drawing -- setting -- a relay center 811 -- 812 the connected cable is connected to the input of a low noise amplifier (LNA) by the predetermined coupling means -- having -- the output -- a frequency converter 921, a waveform shaper 93, and frequency converter 922 And it connects with an antenna 95 through amplifier 94. Frequency converter 921 In the input from a station, it is an oscillator 961. An output is connected and it is a frequency converter 922. In the input from a station, it is an oscillator 962. An output is connected.

[0032] In addition, the configuration shown in drawing 8 and drawing 9 is a relay center 811 and 812 about correspondence relation with the block diagram which corresponds to invention according to claim 4, and is shown in drawing 4 . The prepared transmitting section corresponds to the transfer means 41, and is 821-82 Ns of sending stations. It corresponds to a sending station 43. Moreover, this example configuration is applicable also like each example corresponding to below-mentioned claim 2 and invention according to claim 3.

[0033] Drawing 10 is drawing explaining the transmission system between a relay center and a sending station. Hereafter, actuation of a sending station is explained with reference to drawing 8 - drawing 10 . In addition, about the basic configuration of an earth station, a communication satellite, a relay center, and a mobile station, since it is the same as the example shown in drawing 5 , the explanation is omitted here.

[0034] 811-81 Ns of relay centers **** -- drawing 10 (a) The channel according to individual is assigned so that it may be shown. The transmitting section of these relay centers is an antenna 631, respectively. The subcarrier signal corresponding to the channel mentioned above for the same information as the transmission information transmitted by minding is modulated, and it sends out to a cable.

[0035] the cable which mentioned the low noise amplifier 91 above -- minding -- a relay center 811 and 812 from -- the signal received -- predetermined level -- amplifying --

frequency converter 921 the signal amplified in this way -- oscillator 961 from, although frequency-conversion processing based on the station dispatch number supplied is performed By the frequency-conversion processing, it is an oscillator 962. An oscillation frequency is drawing 10 (a). Since it is set up according to the allotment channel of each relay center by the shown frequency multiplexing transmission system, the intermediate frequency signal of constant frequency is acquired. A waveform shaper 93 restores to the intermediate frequency signal, and compensates the distortion according to a line characteristic. frequency converter 922 the baseband signaling acquired by waveform-shaping processing of a waveform shaper 93 -- transmitter 962 from -- the carrier signal outputted is modulated. Amplifier 94 transmits the carrier signal modulated by doing in this way to the mobile station passed through an antenna 95. Moreover, oscillator 961 When the signal from one relay center is not acquired by changing an oscillation frequency according to the monitor result of the condition of the channel assigned to each relay center, the information transmission to a mobile station is continued based on the signal from the relay center of another side.

[0036] Thus, since the same information as the transmission information directly transmitted to the mobile station which installs a sending station in accordance with the orbit of the rail to which between relay centers (station) is connected, and passes near [the] the sending station from a relay center can be transmitted, the die length of the orbit mentioned above can be large, or also when the travel speed of a mobile station is small, the information transmission to the mobile station can be performed certainly and efficiently. 821-82 Ns of moreover, sending stations Since the information source of the information which should be transmitted to a mobile station based on the house keeping result of the transmission channel corresponding to two adjoining relay centers can be changed, operation which continued also at the time of the failure of a relay center is possible.

[0037] In addition, when this invention is not limited to such a transmission system although the frequency-multiplexing transmission system was adopted with the example configuration mentioned above as a transmission system between two or more relay centers and each sending station, for example, not adopting a time division multiplex system or not fulfilling the desired number of channels only with the surplus transmission channel CH2, it is drawing 10 (b). The channels CHA and CHB which carried out the channel for 2 minutes, and narrow-band-ized it so that it might be shown may be used.

[0038] Drawing 11 is drawing showing the example of a configuration of the mobile station which prepared two or more displays. In drawing, the difference with the example configuration shown in drawing 5 is in the configuration of a mobile station. In this mobile station As shown in drawing 11 and drawing 12 , it replaces with a display 69, and they are four displays 1111-1114. It has. Memory 1121-1124 corresponding to [replace with the memory section 68 and] an individual exception to these displays It has the memory section 113 which it has. Display 1111-1114 It is memory 1121-1124 to an input, respectively. Switching and balancing box 1141-1144 which chooses any one output and is connected It has. And it replaces with a control section 67 and is a switching and balancing box 1141-1144. It has the control section 115 which has the

function to control simulataneously.

[0039] Drawing 13 is drawing showing the configuration of a control section and a switching and balancing box. drawing -- setting -- switching and balancing box 1141 **** -- relay 1311-1314 one side of a make contact -- respectively -- memory 1121-1124 it connects with an output according to an individual, and another side of these make contacts is linked directly -- having -- display 1111 It connects with an input. At a control section 115, it is a switching and balancing box 1141-1144. Switch 1321-1324 of four contacts corresponding to an individual exception It has. The contact common of these switches is connected to the DC-power-supply line of +5V, and all the contacts of each switch are connected to the input coil of four relays formed in the corresponding switching and balancing box, respectively. It is the switch 1321-1324 in which it is shown here by "a", "b", "c", and "d" between such four contacts and input coils of a relay. It shifts one contact at a time for every switching and balancing box, respectively, and connects.

[0040] Hereafter, the display action to each display is explained with reference to drawing 11 - drawing 13 . A control section 115 incorporates the information given from a receive section 66, is based on a predetermined sending-out schedule, and is memory 1121-1124. Information different, respectively is stored. Furthermore, a control section 115 is a display 1111-1114. The completion timing of sending out, and memory 1121-1124 It is based on the amount of information of the stored information, and is a switching and balancing box 1141-1144. Switch 1321-1322 formed, respectively A contact is interlocked and it changes.

[0041] namely, display 1111-1114 **** -- memory 1121-1124 Since the information stored beforehand changes and is outputted for every stream, the various employment which chooses required information according to the installing point of the display in distribution of the entrainment visitor of a subway in the car or in the car is attained.

[0042] In addition, although information which should be sent out for every display by hardware was changed with the example configuration mentioned above, this invention is not limited to such a configuration, but the change method which was adapted for the transmission system of the information over a display should just be used for it.

[0043] moreover, about the output method of the information in a mobile station It is not limited to the change means of displaying for every [which was mentioned above] stream. For example, in a relay center 52, the edit processing section 61 performs edit processing which adds the identification information which shows the class of the information to each information. In a mobile station, a control section 115 is based on such identification information, and it is memory 1121-1124. Display 1111-1114 By setting up connection of a between, the information and operating communication information on a program can also be outputted to the display according to individual.

[0044] Drawing 14 is drawing showing the example corresponding to invention according to claim 2. In drawing, about what has the thing, the the same function, and the

same configuration which are shown in drawing 5 , the same reference number is given and shown and the explanation is omitted here.

[0045] Although it has the memory section 141 which the difference with the example shown in this example and drawing 5 has in the configuration of a mobile station, replaces with the memory section 68 in the mobile station, and has two or more output terminals and one side is connected to a display 69 among these output terminals, another side is connected to an antenna 143 through the retransmission-of-message section 142.

[0046] In addition, about correspondence relation with the block diagram shown in this example and <A HREF="/Tokujitu/tjitemdrw.ipdl?N0000=237&N0500=1E_N/;?:<???8?///&N0001=702&N0552=9&N 0553= 000004" TARGET="tjitemdrw"> drawing 2, the retransmission-of-message section 142 corresponds to the retransmission-of-message means 21. In the mobile station of such a configuration, the retransmission-of-message section 142 transmits the image information and speech information which were memorized by the memory section 141 to in the car with minute power through a predetermined radio channel. The PAX or the crew in the car can get the image information and speech information which were mentioned above using the receiver of dedication of a pocket mold.

[0047] Therefore, information can be certainly transmitted in fixed quality regardless of extent of confusion in the car, or the location of the PAX in in the car [the], and the crew. In addition, in this example, although the retransmission-of-message section 142 is broadcasting image information and speech information again, this invention is very good in the configuration which is not limited to such a configuration, for example, broadcasts only voice again.

[0048] Moreover, about the receiver which the PAX and the crew should possess, the transmit frequencies and the modulation technique of the retransmission-of-message section 142 may be fitted to what can receive using such a general-purpose receiver, using the head telephone stereo which was not limited to the receiver of the dedication mentioned above, for example, contained the television set and tuner of a pocket mold.

[0049] Furthermore, although the PAX used the receiver of a pocket mold according to the individual in this example for example, in the mobile station installed in the car of a special express or the Shinkansen The receive section established in the channel changeover switch 152, the plug 154 for connection with a head telephone 153, the elbow, or the interior of ** 151 established in the elbow of a seat, or the side face of ** 151 as shown in drawing 15 , The receiver of one apparatus which consists of a LCD drop 155 for the PAX of the back seat established in the tooth back which the back of a seat also hangs down is arranged to seriate, as shown in drawing 16 . And about the foremost seat, information may be offered like the PAX who sat on these seats by forming the LCD drop 155 in the wall surface which is ahead of the seat. However, a resending appearance means divides the information which should send out a control section 67 to in the car at the mobile station carrying such a receiver in accordance with predetermined criteria, make correspond to the transmission channel according to

individual, memorizes in the memory section 68, multiplexes the information on the channel which replaced with the retransmission-of-message section 142, and was mentioned above, and send out to a coaxial cable establishes, and the distributor which distributes the multiplexed signal over each receiver forms on the coaxial cable. Here, although the frequency multiplex transmission system which set the occupancy bandwidth of each channel as 6MHz is adopted, this invention is not limited to such a transmission system, but as the multiplexing transmission system to each receiver which minded the coaxial cable in this way is shown in drawing 17 , as long as multiplexing transmission which was adapted for the loading number of a receiver with the desired transmission quality is possible, a method like a time-division multiplexing transmission system and other throats may be used for it.

[0050] Moreover, when carrying out collectively the example shown in drawing 14 about transmission of the transmission information over the receiver by which a fixed setup was carried out at such a seat, the single receiver which has simulataneously the function of the control section which was made to counter the retransmission-of-message section 142, and was mentioned above, and the memory section may be formed, and you may use the approach of carrying out multiplexing transmission through the coaxial cable mentioned above in the recovery output of the receiver.

[0051] Drawing 18 is drawing showing the example corresponding to invention according to claim 3. In drawing, about what has the thing, the the same function, and the same configuration which are shown in drawing 14 , the same reference number is given and shown and the explanation is omitted here.

[0052] The output of another side of the memory section 141 is connected to the input of the information automatic vending machine 181. The input edge is connected to the data input of a receive section 182 in the information automatic vending machine 181, and the data output is memory section 183A -183H. It connects with a data input. a receive section 182 and memory section 183A -183H ***** -- a microprocessor (CPU) 184 is connected through a bus and the input/output port is connected to panel switch (SW)185A -185H, the display 186, the card processing section 187, and the tariff processing section 188 which have been arranged on the actuation display of the front face of the information automatic vending machine 181. As shown in drawing 19 , the IC card insertion opening 191 and the IC card feed hopper 192 are contained in the card processing section 187, and the bill reading opening 193, coin input port 194, and the change return opening 195 are contained in the tariff processing section 188.

[0053] In addition, about correspondence relation with the block diagram shown in this example and drawing 3 , the information automatic vending machine 181 corresponds to the information-media supply means 31. Hereafter, actuation of this example is explained with reference to drawing 18 and drawing 19 .

[0054] A receive section 182 incorporates the information memorized by the memory section 141, and does end storage. A microprocessor 184 is memory section 183A -183H, if the information which should supervise the class of information memorized in this

way, and should be sold with the information automatic vending machine 181 is recognized. Inside, it reads to the thing corresponding to the class of the information, and a command is sent out. The memory section which received this command reads the information corresponding to that command in a receive section 182, and memorizes it.

[0055] As the actuation display of the information automatic vending machine 181 shows to drawing 19, it is panel switch 185A -185H. The informational class and informational tariff which are made to correspond and are sold to the method of the right of these panel switches are displayed. If the PAX injects a tariff from the bill reading opening 193 or coin input port 194, the tariff processing section 188 will recognize the total amount, and will notify it to a microprocessor 184. A microprocessor 184 shows the PAX the class of information which can be sold within the limits of such the total amount, and outputs it to a display 186 by making to push the panel switch corresponding to what [to purchase among such information] into a message.

[0056] A microprocessor 184 sends out the identification information of the information corresponding to the panel switch to the card processing section 187, if a panel switch is pushed according to such a message. The card processing section 187 is memory section 183A -183H, when the IC card which can be written in the IC card insertion opening 191 is inserted. It writes in the IC card which read and mentioned above the information memorized inside by the thing corresponding to the identification information mentioned above using a built-in card writer, and returns from the IC card insertion opening 191. however, the IC card is not inserted in the IC card insertion opening 191 on the contrary, or the card processing section 187 Even if inserted, when the writing mentioned above for the reason of insufficient and others of the storage region which remains on the IC card cannot be performed Based on the interface procedure between the purchasers to whom it is carried out through a panel switch and a display 186, the information applicable to other IC cards or new IC cards which were inserted in the IC card insertion opening 191 is written in and outputted. In addition, about a new IC card, it is supplied according to the interface procedure mentioned above from the IC card feed hopper 192.

[0057] Thus, since according to this example the information received with the mobile station can be recorded on a data-exchange medium and can be sold, a means to give the PAX an opportunity to acquire the information transmitted from the earth station during going out or entrainment, and to reuse the information using OA equipment or the processor of dedication can be offered.

[0058] In addition, although the IC card was used in this example as a medium which memorizes and sells information, as long as this invention suits the informational amount of information and informational use gestalt which it is not limited to such a storage, for example, should be sold like a magnetic tape or a floppy disk, what kind of thing may be used for it.

[0059] Moreover, although this example showed what is depended on cash as the tariff payment approach of an information automatic vending machine, an ATM card and a prepaid card may be used, for example. Furthermore, although each example mentioned

above showed the system which transmits the information transmitted through a satellite circuit to a mobile, this invention is applicable similarly about the system which is not limited to the system which used such a satellite circuit, for example, transmits the contents of a program of a radio broadcasting or television broadcasting to a mobile.

[0060] Moreover, about the information which should be transmitted to a mobile, when secrecy nature and dependability are required, a cipher system and an error correcting code-ized method may be adopted as the radio-transmission circuit to a mobile station from the transmission line, base station, and sending station of the transmission information over a relay center, and when amount of information is big, in order to secure transmission timing or to perform positive implementation of a transmission protocol, a compression transmission system may be adopted.

[0061] Furthermore, about the dependability of the information transmission system which applied this invention, it is also possible to make it adapted for the structure of a system, for example, to apply a predetermined doubleness configuration to the principal part or the whole of a relay center, a sending station, and a mobile station.

[0062] Moreover, in each example mentioned above, although the radio transmission system by the radio frequency of a millimeter wave band or an SHF band was adopted as the information transmission to a mobile station from the information transmission and relay center to a relay center, or the sending station, the transmission system which was not limited to such a method, for example, used the optical space transmission system or used the feeble electric wave may be used for this invention.

[0063] Furthermore, antenna 632 which receives the radio signal transmitted from the relay center or the sending station for every car of the subway of **** organization in each example mentioned above Although other facilities are carried the configuration which connects the section which carried this invention only in one specific car about the facility which it is not limited to such a configuration, for example, can be used in common by each **, and was carried in the facility for every ** through a cable and others non-using in common -- ** -- you may carry out.

[0064]

[Effect of the Invention] As explained above, a radio transmission is carried out to a mobile station from the sending station arranged in accordance with the orbit which connects between the relay center and relay center with this invention after receiving and memorizing the information received from the wireless circuit in an end relay center, and it supplies as a data-exchange medium which recorded voice, an image, and these within the mobile in which the mobile station was installed in the information.

[0065] That is, since it becomes possible to acquire certainly the information offered through the wireless circuit which cannot access the mobile station in the mobile in which the mobile station was installed, the efficient information transmission which was adapted for the various demands according to the employment gestalt and use gestalt of the mobile to the mobile becomes possible.

[Claim(s)]

[Claim 1] In the information transmission system which transmits information to a mobile station (11) through a wireless circuit A transmission information storage means to receive and memorize information from said wireless circuit (13), The mobile station is equipped with the relay center (17) which has the transmitting means (15) which carries out the radio transmission of the information memorized by said transmission information storage means (13) in the shunt on the orbit of the mobile in which said mobile station (11) was installed. The information transmission system characterized by equipping said mobile station (11) with an output means (19) to restore the information by which the radio transmission was carried out and to output in said mobile with said transmitting means (14).

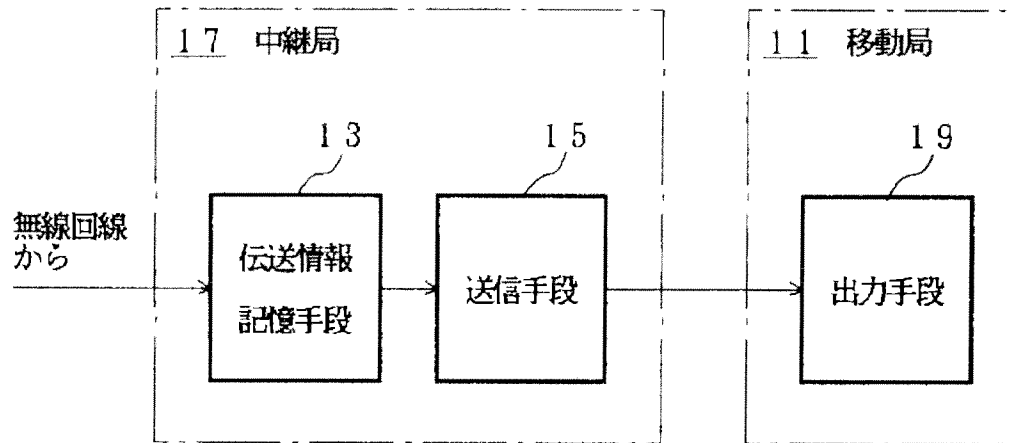
[Claim 2] In the information transmission system which transmits information to a mobile station (11) through a wireless circuit A transmission information storage means to receive and memorize information from said wireless circuit (13), The mobile station is equipped with the relay center (17) which has the transmitting means (15) which carries out the radio transmission of the information memorized by said transmission information storage means (13) in the shunt on the orbit of the mobile in which said mobile station (11) was installed. The information transmission system characterized by equipping said mobile station (11) with the retransmission-of-message means (21) which incorporates the information by which the radio transmission was carried out and carries out a radio transmission again into said mobile with said transmitting means (15).

[Claim 3] In the information transmission system which transmits information to a mobile station (11) through a wireless circuit A transmission information storage means to receive and memorize information from said wireless circuit (13), The mobile station is equipped with the relay center (17) which has the transmitting means (15) which carries out the radio transmission of the information memorized by said transmission information storage means (13) in the shunt on the orbit of the mobile in which said mobile station (11) was installed. The information transmission system characterized by equipping said mobile station (11) with an information-media supply means (31) to restore the information by which the radio transmission was carried out, and to memorize and supply a data-exchange medium with said transmitting means (15).

[Claim 4] Two or more relay centers (171-17 Ns) are arranged on the multipoint link instituted in claim 1 thru/or invention according to claim 3 in accordance with the orbit of the mobile in which the mobile station (11) was installed. In these relay centers (171-17 Ns) It has a transfer means (41) to transmit the information memorized by the transmission channel assigned to the local station on said multipoint link at the transmission information storage means (13). Between two relay centers which adjoined in accordance with said orbit The information transmission system characterized by having the sending station (43) which incorporates the information transmitted to said two relay centers from the transfer means (41) of these relay centers through the transmission channel assigned according to the individual on said multipoint link, and carries out a radio transmission to said mobile station (11).

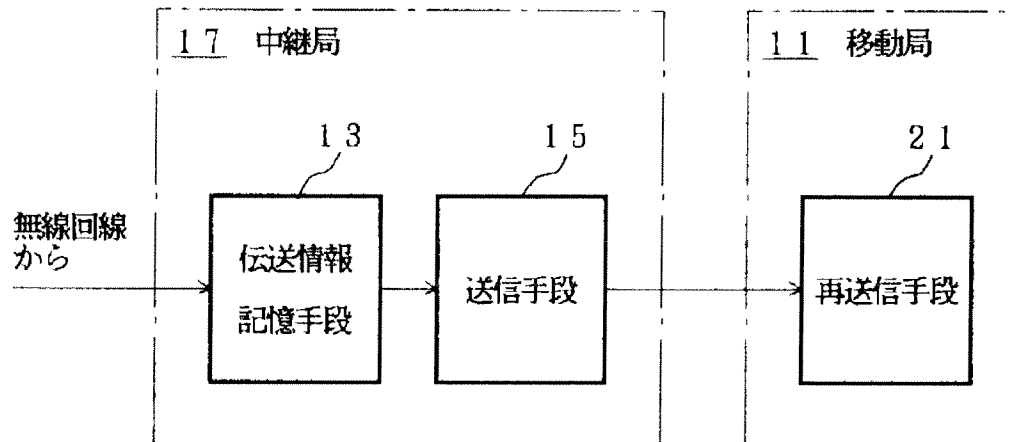
[Drawing 1]

請求項 1 に記載の発明の原理ブロック図



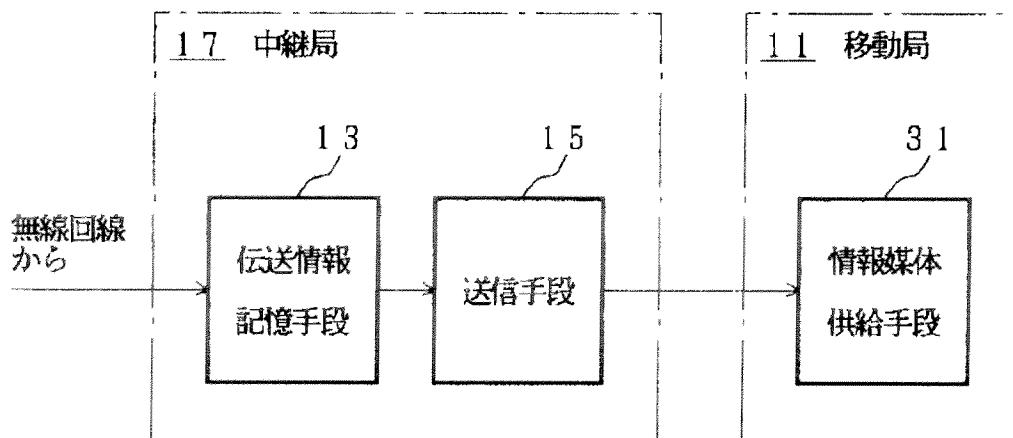
[Drawing 2]

請求項 2 に記載の発明の原理ブロック図



[Drawing 3]

請求項 3 に記載の発明の原理ブロック図



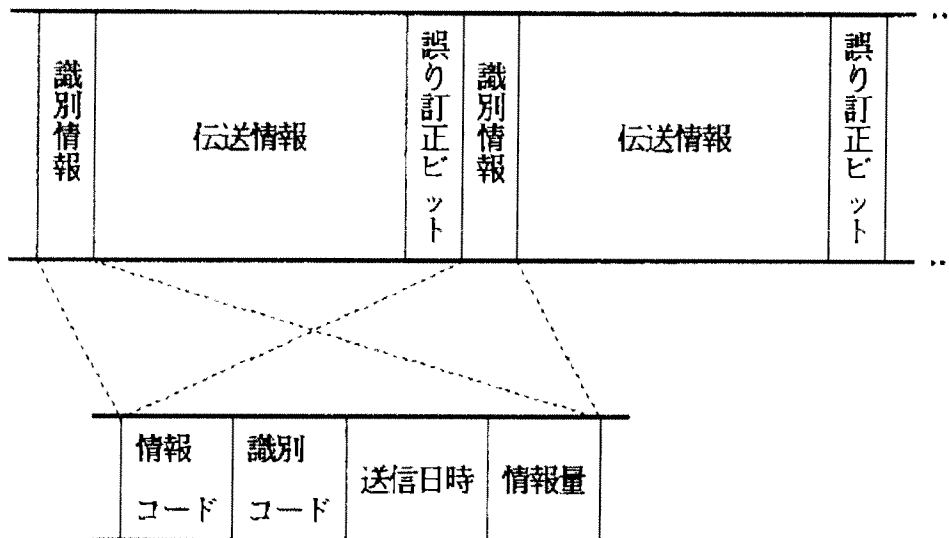
[Drawing 6]

中継局の編集処理部の記憶領域を示す図

定時に送出 すべき情報	宣伝情報	中継局に 特有の情報	緊急連絡 情報	運用業務 情報
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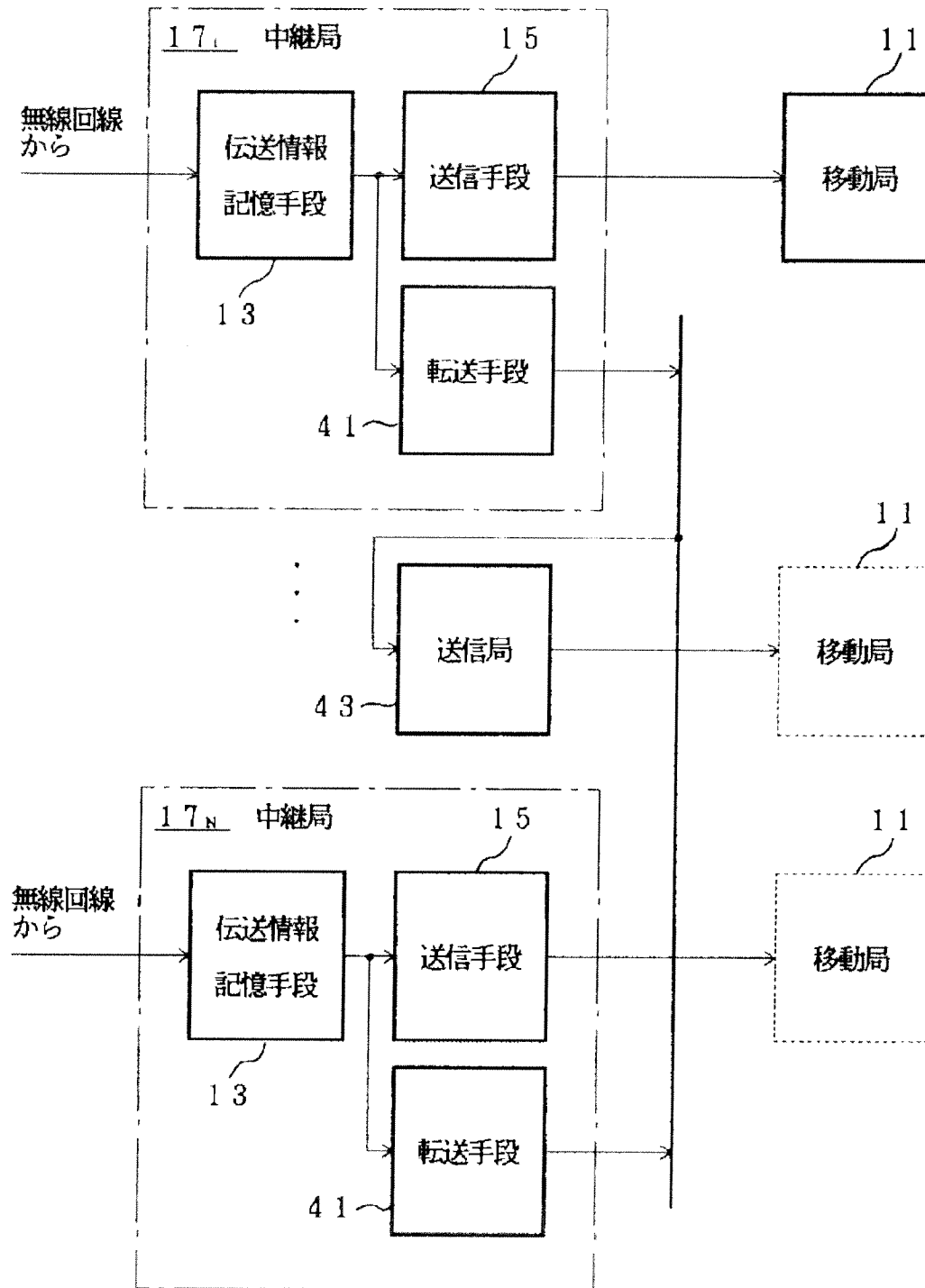
[Drawing 7]

地球局から送信される情報のフレーム構成を示す図



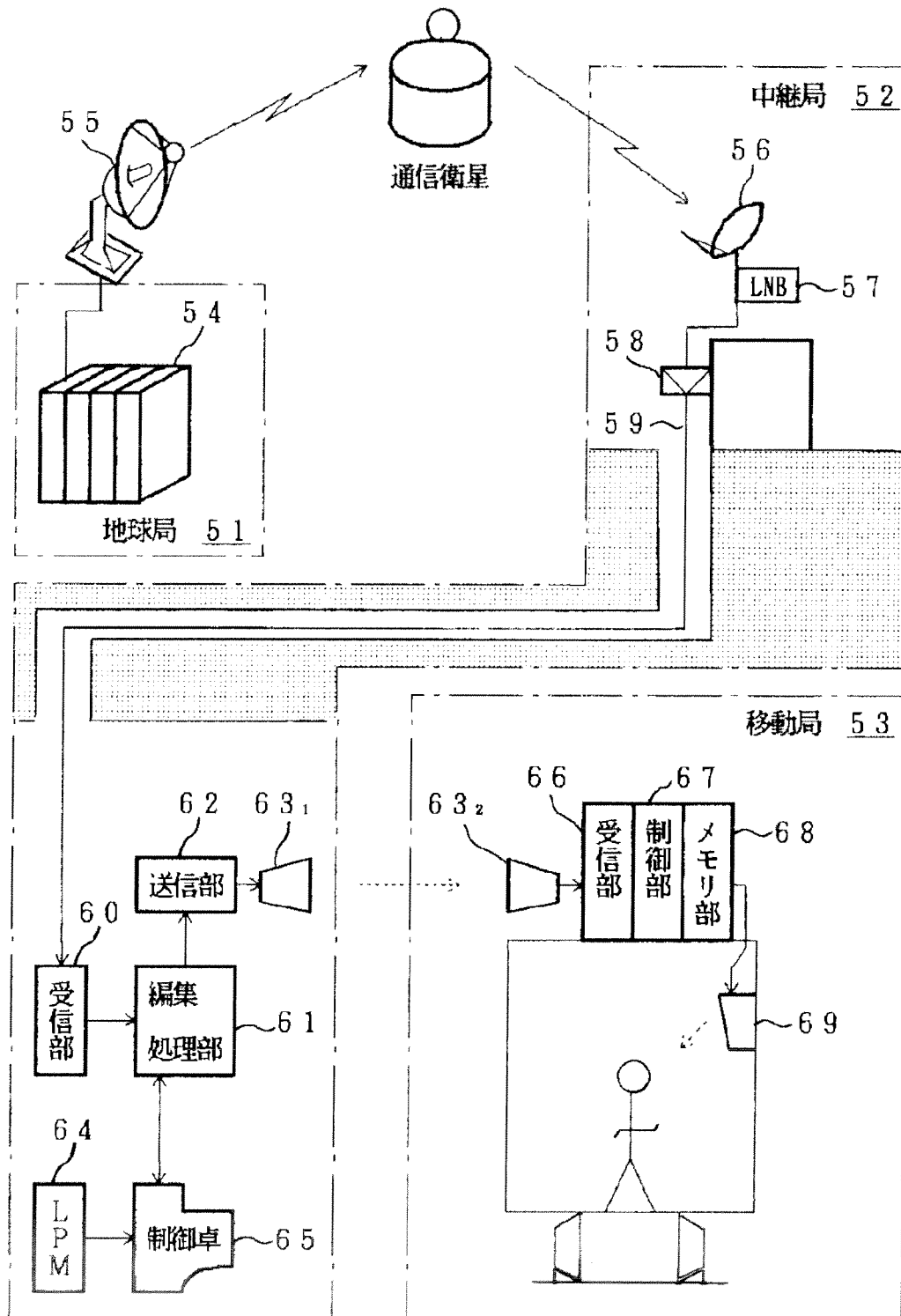
[Drawing 4]

請求項 4 に記載の発明の原理ブロック図



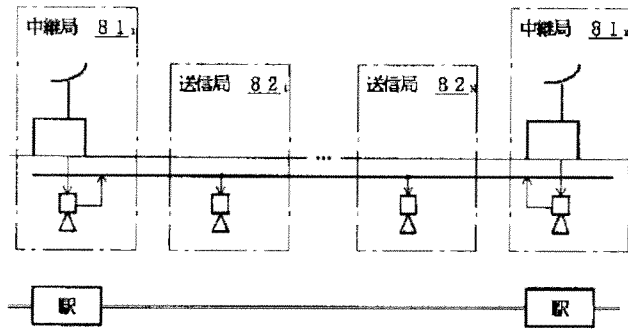
[Drawing 5]

請求項 1 に記載の発明に対応した実施例を示す図



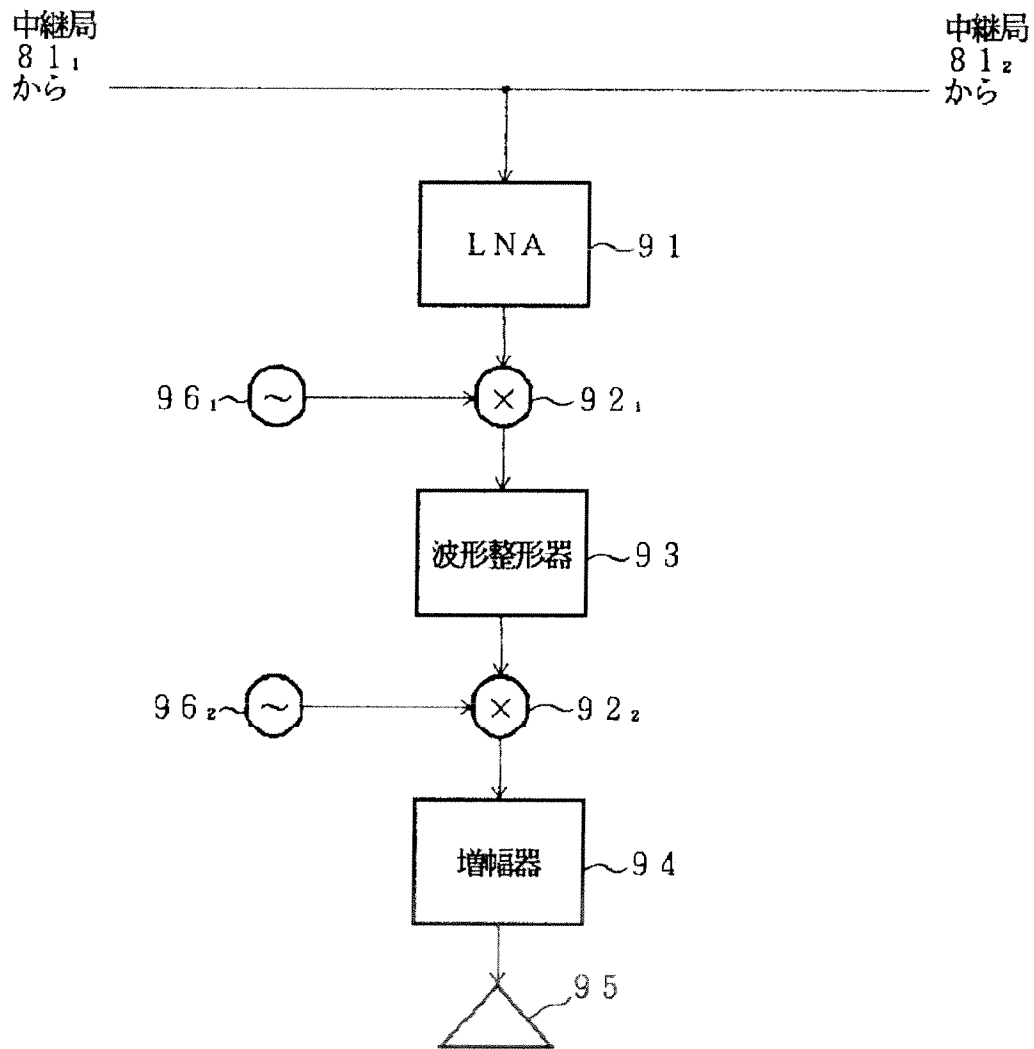
[Drawing 8]

隣接中継局間に送信局を配置した実施例構成を示す図



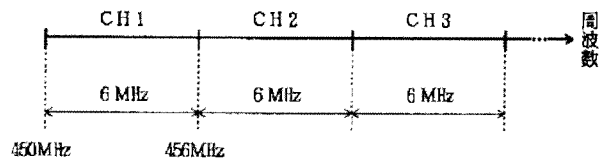
[Drawing 9]

送信局の構成を示す図



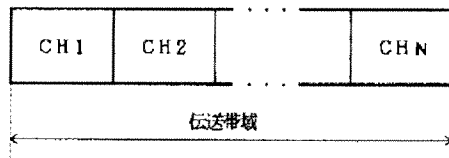
[Drawing 17]

同軸ケーブル上の伝送方式を説明する図

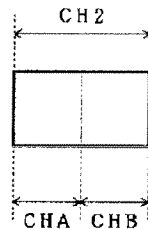


[Drawing 10]

中継局と送信局との間の伝送方式を説明する図



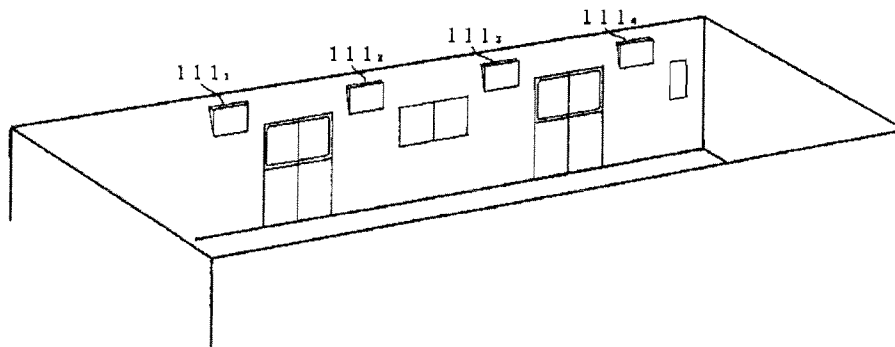
(a)



(b)

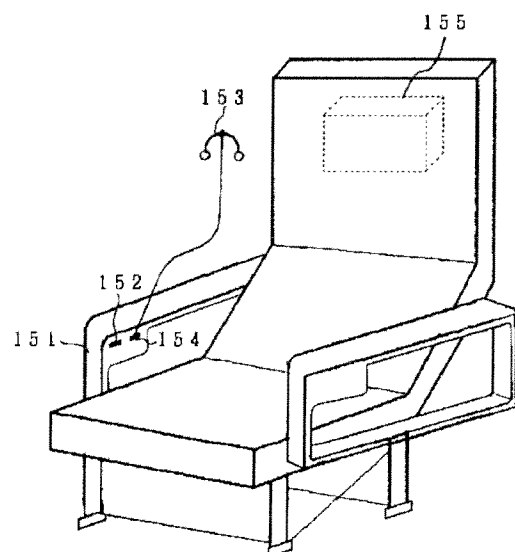
[Drawing 12]

移動体内における表示器の配置を示す図



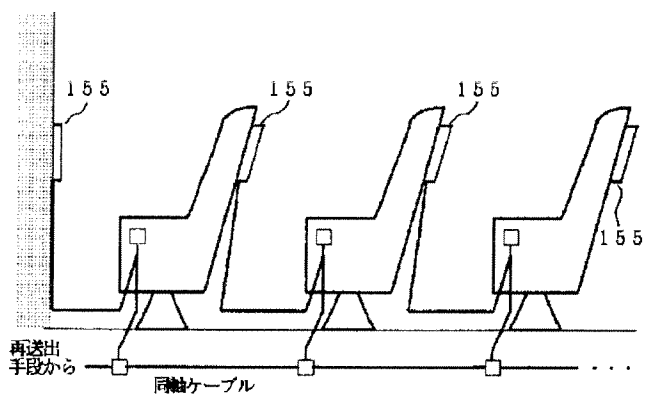
[Drawing 15]

座席と一体化された受信機の構成を示す図



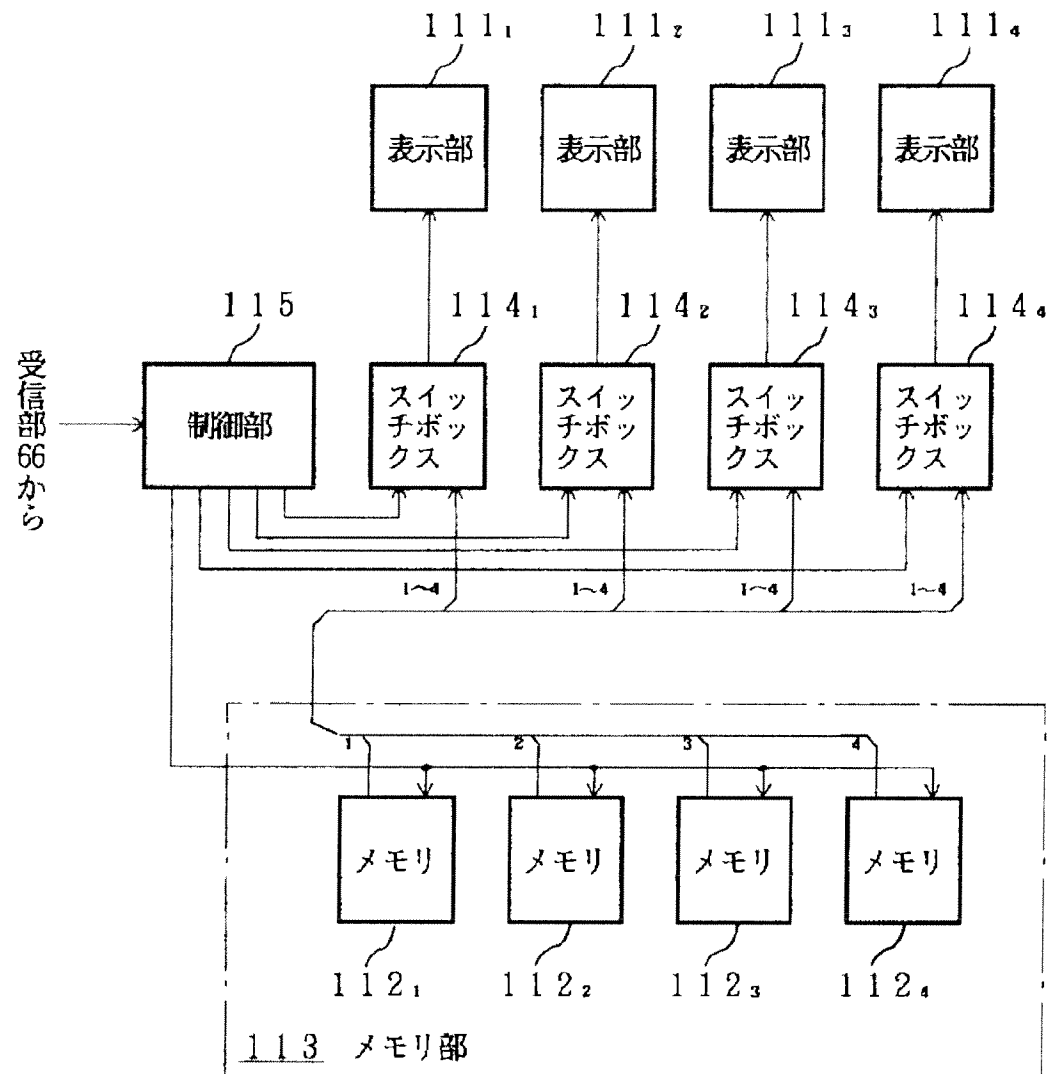
[Drawing 16]

座席と一体化された受信部の実施方法を示す図



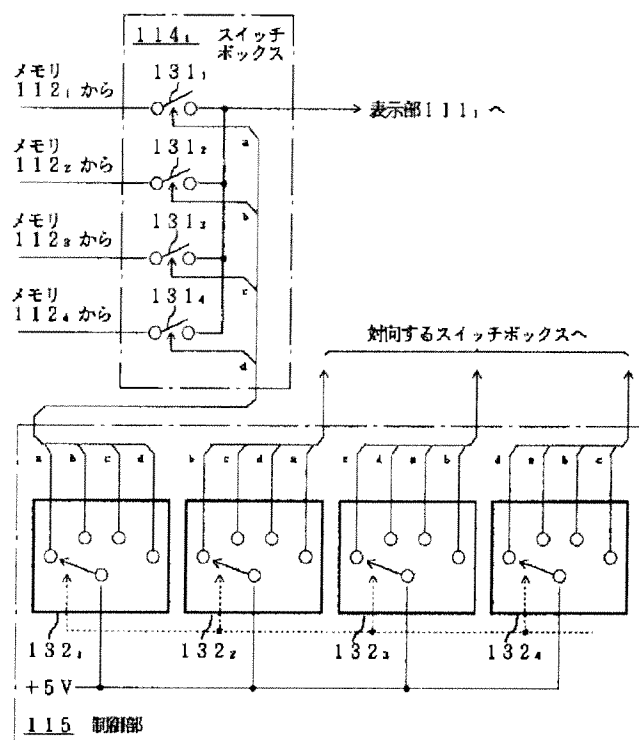
[Drawing 11]

複数の表示部を設けた移動局の構成例を示す図



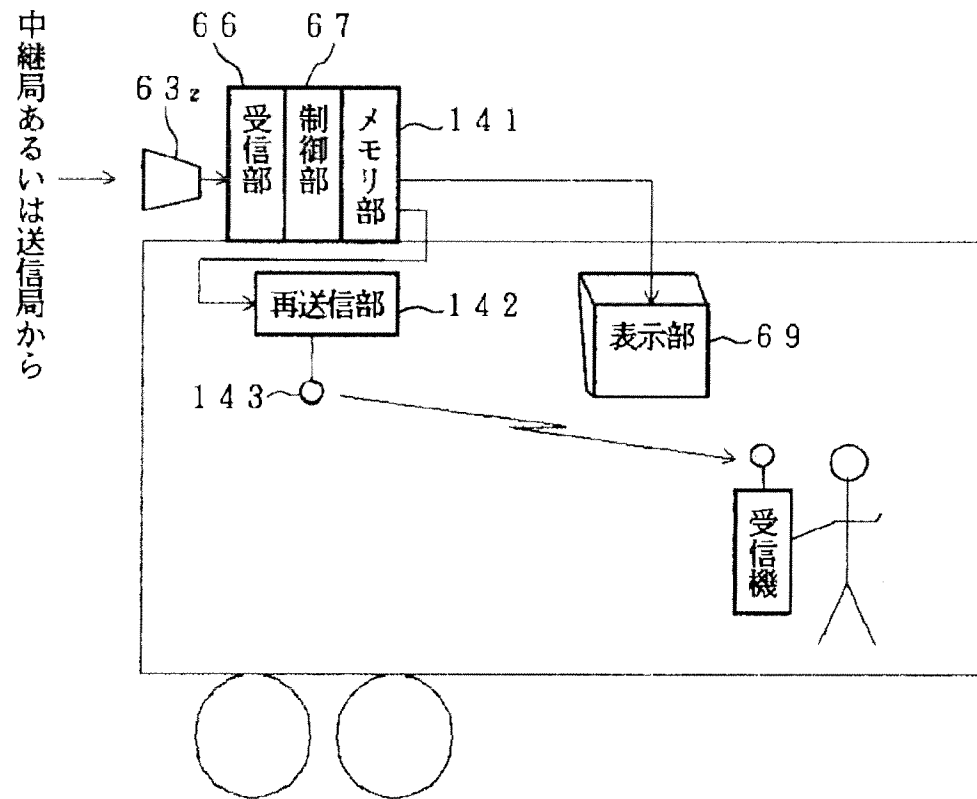
[Drawing 13]

制御部およびスイッチボックスの構成を示す図



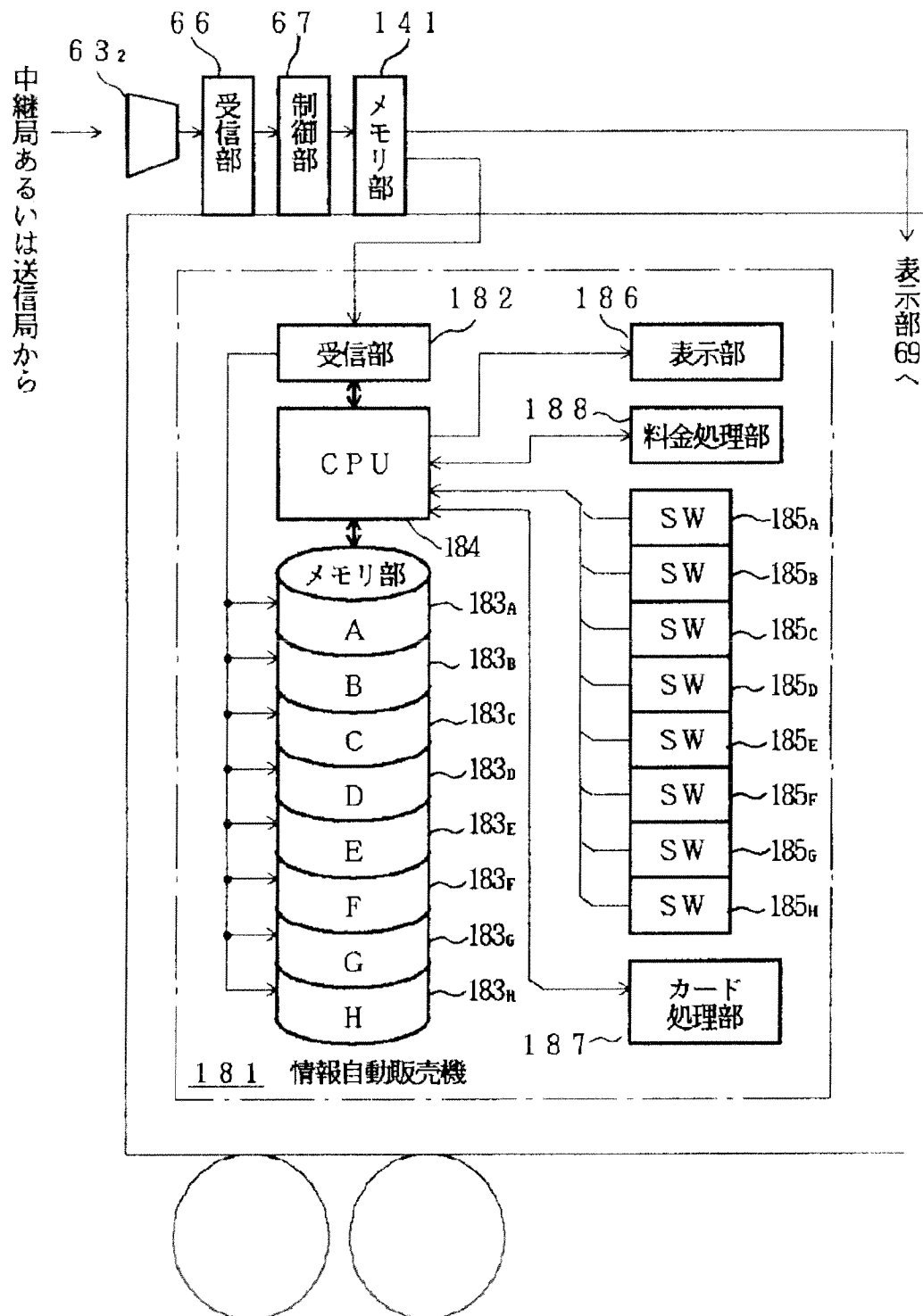
[Drawing 14]

請求項2に記載の発明に対応した実施例を示す図



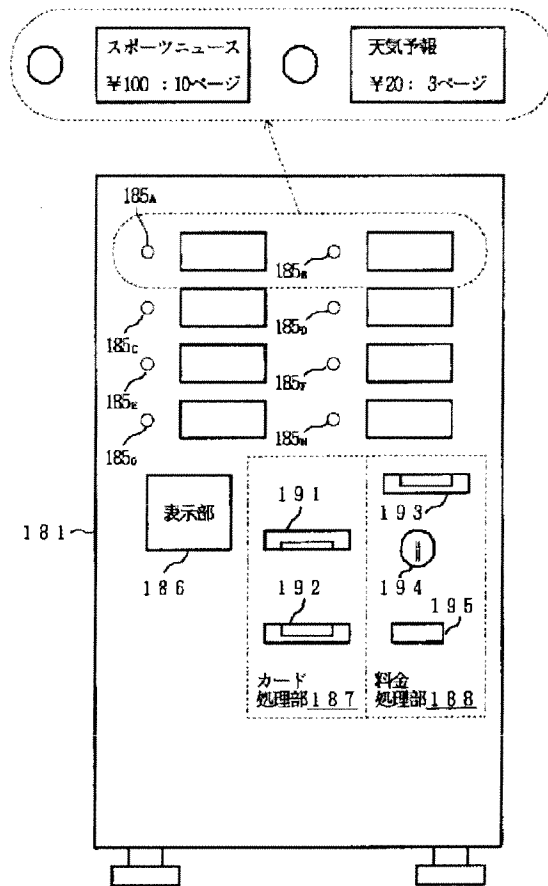
[Drawing 18]

請求項3に記載の発明に対応した実施例を示す図



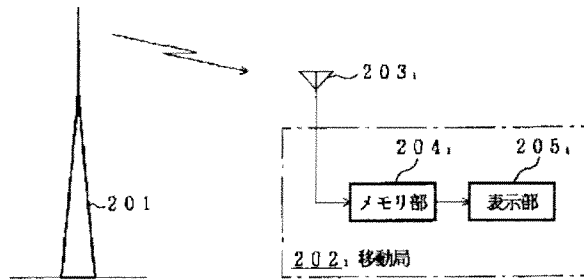
[Drawing 19]

情報自動販売機の操作表示部を示す図

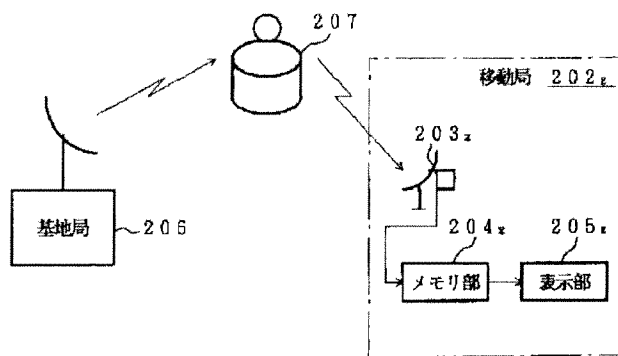


[Drawing 20]

従来の情報伝送システムの構成例を示す図



(a)



(b)